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ORDER NO. 3377

UNITED STATES OF AMERICA
POSTAL REGULATORY COMMISSION
WASHINGTON, DC 20268-0001

Before Commissioners: Robert G. Taub, Acting Chairman;
Nanci E. Langley, Vice Chairman;
Mark Acton; and
Tony Hammond

Periodic Reporting
(Proposal One)

Docket No. RM2016-7

ORDER APPROVING ANALYTICAL PRINCIPLES USED IN PERIODIC REPORTING (PROPOSAL ONE)

(Issued June 17, 2016)

I. INTRODUCTION

The Postal Service, in a petition filed pursuant to 39 C.F.R. § 3050.11, seeks Commission approval of a proposed change in an analytical principle relating to the Postal Service's periodic reports.[1] For the reasons discussed below, the Commission approves Proposal One. This Order reviews the procedural history, provides background on the current methodology, describes Proposal One, addresses related filings, and presents the Commission's analysis and conclusion.

[1] Petition of the United States Postal Service Requesting Initiation of a Proceeding to Consider Proposed Changes in Analytical Principles (Proposal One), April 5, 2016 (Petition).

II. PROCEDURAL HISTORY

On April 5, 2016, the Postal Service petitioned the Commission to initiate a rulemaking proceeding to consider Proposal One, which concerns a change in the methodology for reporting revenue, pieces, and weight for certain international outbound products in the quarterly Revenue, Pieces, and Weight (RPW) report.[2] The methodology relies mainly on the System for International Revenue and Volume, Outbound–International Origin-Destination Information System (SIRVO), with adjustments using data from other census systems.[3] Attachment A to the Petition provides a detailed description of the proposal. Attachment B (filed in redacted and unredacted versions) identifies product-level impacts.[4] Attachment C presents a technical note on the proposed estimator.

On April 8, 2016, the Commission issued Order No. 3225 establishing the instant docket for consideration of the Petition, designating a Public Representative to represent the interests of the general public, and establishing deadlines for filing comments and reply comments.[5] The Commission issued, and the Postal Service responded to, two information requests.[6] The Public Representative filed comments on

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[2] The RPW report is filed quarterly with the Commission pursuant to 39 C.F.R. § 3050.25.

[3] The current collection, estimation, and RPW reporting process for international products is generally referred to herein as the methodology or the SIRVO methodology. The collection, estimation, and RPW reporting process for international products presented in the Petition is referred to as Proposal One, the proposed methodology, or the proposed SIRVO methodology.

[4] *See* Notice of Filing of USPS-RM2016-7/NP1 and Application for Nonpublic Treatment, April 5, 2016, concerning the unredacted version of Attachment B.

[5] Notice of Proposed Rulemaking on Analytical Principles Used in Periodic Reporting (Proposal One), April 8, 2016 (Order No. 3225).

[6] *See* Chairman's Information Request No. 1, April 14, 2016; Responses of the United States Postal Service to Questions 1-6 of Chairman's Information Request No. 1, April 25, 2016 (Response to CHIR No. 1). The Postal Service filed a motion for late acceptance of its Response to CHIR No. 1. Motion of the United States Postal Service for Late Acceptance of its Responses to Chairman's Information Request No. 1 (Motion). The Motion is granted. *See also* Chairman's Information Request No. 2, April 29, 2016; Responses of the United States Postal Service to Questions 1-3 of Chairman's Information Request No. 2, May 11, 2016 (Response to CHIR No. 2). The Postal Service filed non-public materials in support of its Response to CHIR No. 2. Notice of Filing of USPS-RM2016-7/NP2 and Application for Nonpublic Treatment, May 11, 2016.

May 20, 2016.[7] The Postal Service filed reply comments on June 2, 2016.[8] No additional comments were received.

III. BACKGROUND

The purpose of the current SIRVO methodology is to provide accurate product-level estimates at the national level. Petition at 3. This methodology uses SIRVO's sample data to apply probability-based statistical expansions to known quarterly dispatch weights. *Id*. at 3-4. The expansions are by destination country, mail category, mail class/subclass (letter post and parcel post), and receptacle type (letter trays, flat trays, bags, and bulk containers).[9]

The current methodology combines sample-generated estimates with census data obtained from several other systems to develop national estimates. *Id.* Some of the national estimates are then replaced with census data at the national level (or, in some instances, at the price group level). *Id.* Estimates that are not replaced are adjusted to keep overall control weights constant and ensure that the combined census and estimated weights match the total dispatch weight.[10]

IV. PROPOSAL ONE

Proposed methodology. The proposed methodology replaces the current methodology's probability-based estimator with a model-based regression estimator and adds more census data sources. *See id.* at 3-4, 5, 7. For letter post products (such as First-Class Mail International, First-Class Package International Service, and International Priority Airmail), the new model develops estimates for revenue and pieces

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[7] Public Representative Comments on Proposed Changes in Analytical Principles Used in Periodic Reporting (Proposal One), May 20, 2016 (PR Comments).

[8] Reply Comments of the United States Postal Service, June 2, 2016 (Reply Comments).

[9] *Id.* For Canada, the expansion is also by origin exchange office. *Id*. at 4.

[10] *Id.* While certain census data sources (specifically, Point of Sales (POS) and Click-N-Ship systems) have product, country, and weight-step information, the current SIRVO methodology does not use this level of detail. *Id.* at 5.

within small sampling strata where census weight data are available. *Id*. at 5-6. For parcel post products (such as Priority Mail International), where pieces are known from the dispatch system, the new model estimates only revenue, but not at the same level of stratum as the letter post model because of limitations on sample size. *Id*. at 6.

The Postal Service asserts that the regression estimator provides "the best linear unbiased predictor" and that a robust variance estimator abates “potential negative bias in the variance estimates due to model misspecifications.” *Id*. The Postal Service states that the estimator is “used independently for each stratum,” and national-level estimates are “obtained through summing across relevant expansion strata[-]level estimates.” *Id*. If sample data are not available for a given expansion strata, the program searches for suitable proxy sample data beginning with the same expansion strata in an earlier time period, then widens the criteria until usable sample data are found. *Id*.

The proposed methodology, like the current one, adjusts sample estimates with census data obtained from other systems, so that the sum of adjusted regression estimates and census data equals the known dispatch weight. *Id*. at 7. The Postal Service states that as a result of census adjustments in the proposed methodology, about 50 percent of the revenue associated with FY 2015 product estimates is based on census data sources. *Id*. at 8. It further observes that as more detailed data and additional census data sources become available, similar approaches can be used to replace proportions of regression-based estimates with census data. *Id*.

Rationale. The Postal Service states that the proposed methodology will improve the national product estimates in the RPW report and the country-level estimates used by the Postal Service for monitoring business relationships, product performance, and growth opportunities. *Id*. at 2. It notes that the adoption of Proposal One will significantly reduce the margins of error for product revenues and volumes. *Id.* at 10. It also states that the new methodology will allow "for more granularities in the estimates by country and stream, providing more information for making international product business decisions." *Id*. at 11.

Impact. The following table identifies the products affected by Proposal One.

Table IV-1
List of Affected Outbound International Product Categories

Market Dominant	Competitive
Outbound First-Class Mail International	Outbound Priority Mail International
Free Mail	Outbound Direct Sacks (M-bags)
U.S. Postal Service Mail	First-Class Package International Service
International Ancillary Services	International Ancillary Services

Source: Petition at 2-3.

A comparison of the FY 2015 revenues, volumes, and weights under the current and proposed methodologies appears in Petition, Attachment B. The Postal Service asserts that the impact on outbound products reflects the changes in estimation methodology and use of census data described in the Petition. *Id*. at 9-11.

The Postal Service explains that adoption of Proposal One does not affect the amount of total FY 2015 revenue, but total competitive revenue would increase, with a corresponding decrease in market dominant revenue. *Id.* at 8-9. Similarly, competitive volumes increase while market dominant volumes decrease. *Id*.

V. COMMENTS AND REPLY COMMENTS

A. Public Representative Comments

The Public Representative recommends approval of Proposal One, noting that the accuracy of the RPW report for certain outbound international products should improve with the introduction of a model-based regression estimator and the greater use of census data. PR Comments at 2, 3. However, she suggests that several issues should be considered when evaluating the proposal. *Id*. at 3. First, she states that she

"is cautious of the Postal Service's use of ever widening proxy data." *Id*. She suggests that improvements in margin of error may not be achieved under certain circumstances and that the extensive use of proxies may introduce additional errors. *Id*. She suggests that the Commission consider whether the likely magnitude of this error has been accounted for in the Postal Service's margin of error estimates. *Id*. Second, the Public Representative notes that the Postal Service makes modifications to SIRVO estimates to match data from another automated system and other census data. *Id*. She states that "the more modification[s]…, the increased chance for error and mismeasurement." *Id*. at 3-4.

The Public Representative notes that the Postal Service states that data from automated systems, such as POS, replacing manual (sample) data in the proposed SIRVO methodology will still be comprised of a sample of locations, incorporating all pieces in the sample instead of every n^{th} piece. *Id*. at 4. She concludes this will likely improve the margin of error and reduce the bias from using a ratio estimator, given that the weights used to expand from sample values to international total values are based on both a sample of location and a sample of pieces. *Id.* However, she asserts the Postal Service may be trading one type of error for another: sample of volume per site error for regression error. *Id*. She also claims it is unclear whether the new margin of error is a combination of the regression error and the error associated with selecting sample sites (not all sites). *Id*.

B. Postal Service Reply Comments

The Postal Service observes that the Public Representative recommends approval of Proposal One but also raises concerns about reliance on proxy data in the new estimation process, additional modifications to SIRVO-developed estimates, and possible errors in the estimation methodology. Reply Comments at 1. With respect to the use of proxy data, the Postal Service states that these data "play a very small role in the expansion process." *Id*. It asserts that in FY 2015, proxy data were used in 2.6 percent of the air letter post mail stream and 1.9 percent of the air parcels mail stream.

Id. The Postal Service considers the Public Representative's other concerns insufficient reasons for questioning or delaying the approval of Proposal One. *Id*.

VI. COMMISSION ANALYSIS

The Commission approves Proposal One. The Commission finds that this proposal builds on the opportunities provided by census data to improve estimation of revenue, pieces, and weight, and incorporates the enhanced estimation tools provided by regression analysis. The Commission has approved the use of both expanded census data and regression estimators in the past to improve the RPW report.[11]

This expanded use of census data improves data quality by providing a more complete and comprehensive view of mail flows leaving the United States. The Postal Service notes that approximately 50 percent of the revenue (or 63 percent of the known dispatch weights) will be based on census data, and that this percentage may increase as additional census data sources become available. Petition at 8.

The transition from a probability-based estimator to a model-based regression estimator will improve the accuracy of the estimates for revenue, pieces, and weight. The Postal Services notes that the regression estimator is reducible to the ratio estimator. *Id.* Attachment A at 6. The Commission has previously approved the usage of ratio estimators for revenue, piece, and weight estimation,[12] and the Postal Service has demonstrated the reducibility of the regression estimator to the ratio estimator. *See* Response to CHIR No. 2, question 3.

An effective regression estimator requires a sufficient sample size and an unbiased predictor. The Postal Service has confirmed the regression estimator is the best linear unbiased predictor for the specified model, and that the variance estimator is sufficiently robust to abate potential bias in the estimates. Petition at 6; *Id.* Attachment

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[11] *See* Docket No. RM2015-15, Order No. 2732, Order Approving Analytical Principles Used in Periodic Reporting (Proposal Six), September 28, 2015; and Docket No. RM2016-1, Order on Analytical Principles Used in Periodic Reporting (Proposal Eleven), December 18, 2015 (Order No. 2901).

[12] *See* Order No. 2901 at 5.

C. The Postal Service also has provided the average sample size of a stratum used for estimation: 10.9 for letter post and 46.5 for parcel post. Response to CHIR No. 1, question 2; Response to CHIR No. 2, question 1. A statistical rule of thumb for regression analysis is to have at least 30 observations in a sample for a sufficiently precise regression. The average sample size for parcel post meets this rule, but the average sample size for letter post does not. The Postal Service clarifies that the letter post regression is used to estimate revenue and pieces for 1,533 strata, which are then summed together and adjusted with census data to create the total letter post estimate. Response to CHIR No. 2, question 1a. The Postal Service also provides the coefficient of variation (CV)[13] for each letter post and parcel post stratum for Q1 of FY 2015. *Id*. question 1b. The letter post CVs generally meet the threshold of reliability,[14] although the parcel post CVs are more reliable, likely because of the larger sample size. The Postal Service acknowledges the imprecision of its estimates but notes that they are still the best linear unbiased predictor. *Id.* The Commission agrees that the regression-based estimator is an improvement but encourages the Postal Service to increase the sample size of letter post strata to improve the precision of its estimates.

The Postal Service notes that adoption of Proposal One will directly improve the reliability of its estimates of revenue and pieces by reducing their margins of error. *See* Petition at 10. This is the combined result of the adoption of census data and an improved estimator for sample data. The overall impact on revenues and volumes is minimal, with the largest impact of a 0.1-percent reduction in revenue recognized for First-Class Mail. *Id.* Attachment B at 1. The margins of error measure the range of the estimate within a given confidence interval (usually 95 percent). The Postal Service, therefore, can be 95 percent confident that the true estimates of revenue and pieces are within the range specified by the margins of error. Any reduction in this range while

[13] The CV is derived from the margin of error and is the standard error of the estimate divided by the mean of the estimate. It is used to analyze the reliability of an estimate.

[14] *See* Andreas Oranje, ETS Research Report, Jackknife Estimation of Sampling Variance of Ratio Estimators in Complex Samples: Bias and the Coefficient of Variation, June 2006, at 12.

retaining the same confidence interval brings the Postal Service closer to the true estimate of revenue and pieces, which increases data reliability.

The Public Representative raises two issues that the Postal Service did not directly address: the risk of additional error because of the proposed modifications, and the possibility of trading sample error for regression error. PR Comments at 3-4. With respect to the first issue, it is true that further modifications to the methodology may lead to error. The proposed modifications, however, result from the inclusion of additional census data, which reduces the proportion of data collected in the proposed SIRVO methodology that is sample-based and therefore subject to substantial adjustment. With respect to the second issue, it is correct that the regression estimator is imprecise, particularly for letter post. The estimator is, however, the best linear unbiased predictor for the model, and still improves upon the CVs and margins of error of the previous sampling-based system.

VII. ORDERING PARAGRAPH

It is ordered:

For purposes of periodic reporting to the Commission, the changes in analytical principles proposed by the Postal Service in Proposal One are approved.

By the Commission.

Stacy L. Ruble
Secretary